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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,241	10/03/2003	Hideyuki Sakaida	Q77625	9108

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EXAMINER

SMITH, JEFFREY S

ART UNIT	PAPER NUMBER
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2635

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/677,241

Applicant(s)

SAKAIDA, HIDEYUKI

Examiner

Jeffrey S. Smith

Art Unit

2635

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/3/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to because of the following. In Figure 2, the dotted image should include a reference number. In figure 3, the elements should have reference numbers, including reference number 12 to indicate that this is an example of the x-ray source 12 as shown in figure 2.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

Throughout the application, the word "blue" is used instead of the word blur. For example, the abstract of the disclosure is objected to because "correcting blue amount" should be "correcting blur amount". Correction is required. See MPEP § 608.01(b).

Similarly, the use of the word "blue" throughout the rest of the application should be changed to "blur".

Claim Objections

Claims 2, 4 and 6 are objected to because of the following informalities: "blue amounts" should be "blur amounts". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 3 and 5, "first detection data and second detection data" should be "first set of detection data and second set of detection data" to have antecedent basis consistent with "plural sets of detection data." Similarly, "the detection data in which

blur amount has been corrected" should be "the set of detection data in which blur amount has been corrected" in order to have antecedent basis.

In claims 2, 4 and 6, "a focal size of a radiation source in said plural sets of detection data" is unclear because it implies that there is only one focal size for the radiation source in the plural sets of detection data, yet figure 2 of the application implies that the focal size in each set of detection data changes as the distance from the radiation source to the detection plane changes.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 5 and 6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 5 and 6 recite a computer program per se, which is not embodied on a computer readable medium.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Hard x-ray quantitative non-interferometric phase-contrast imaging" by Gureyev et al., SPIE vol. 3659, February 1999, pp. 356-364 ("Gureyev") in view of U.S. Patent No. 6,404,848 issued to Ishisaka et al. ("Ishisaka").

For claims 1, 3 and 5, Gureyev discloses "plural sets of detection data obtained by detecting intensity of radiation on plural detection planes at different distances from the object, said plural sets of detection data representing image information on the plural detection planes." (See abstract, "the appropriate processing of phase-contrast images obtained in the in-line geometry." See also Figures 1 and 2).

Gureyev discloses "obtaining differential data representing difference between first detection data and section detection data of said plural sets of detection data." (See page 357, "processing of the differential images.")

Gureyev discloses "obtaining Laplacian of phase on the basis of said differential data and any one of said plural sets of detection data." (See equation 3a on page 357).

Gureyev discloses "obtaining phase data of the radiation by performing inverse Laplacian computation on the Laplacian of phase." (See page 360 "There are many well-known methods for solving equations of the type (2) and (3)").

Gureyev does not disclose "correcting blur amount."

Ishisaka discloses "correcting blur amount." (See column 4 lines 24-29, "by making the edge enhancement described above generate simultaneously, this blur is eliminated").

It would have been obvious to one of ordinary skill in the art at the time of invention to include the blur correction of Ishisaka with the phase-contrast imaging of Gureyev, because, by eliminating the blur, a "radiographing image having the excellent sharpness is obtained," as taught by Ishisaka at column 4 lines 24-29.

For claims 2, 4 and 6, Ishisaka discloses that the blur is "caused by a focal size of a radiation source." (See column 7, lines 31-34 "when the size of the focal spot is increased...the blur width B due to the penumbra is increased"). Ishisaka further discloses that the blur is corrected by "uniforming blur amounts...on the basis of respective blur functions." (See blur functions shown by equations 1-4 in columns 4-6. When the blur functions are applied to multiple images, the blur corrections are "uniform" because the blurs are eliminated, as discussed in column 4 lines 24-29).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Nos. 6,704,591; 6,724,857; 6,792,070; and 6,600,807, all of which are issued to Sakaida, disclose methods for restoring phase information, but lack the blur functions.

U.S. Patent Nos. 6,526,121 issued to Hwu et al.; 6,493,422 issued to Wilkins et al.; 5,715,291 issued to Momose; and U.S. PG Publication 2005/0129169 disclose examples of phase retrieval in phase contrast imaging.


U.S. Patent No. 6,470,097 issued to Lai et al. and Japanese Patent No. 358178675A by Honda disclose blur correcting functions used in x-ray imaging.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey S. Smith whose telephone number is 571 270-1235. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin Lateef can be reached on 571 270-1245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JSS 10-27-06
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MARVIN LATEEF
SUPERVISORY PATENT EXAMINER